

Example

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i*utiticanud the* Commissionvivof Dasonss, praying aircraft speed Indicators, hi Patent for an

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Nam Cherefour the present Patent

328 poseph France ₩ 1970 1971 Francis Ron hesbitt,

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Testimony Wherent (OMMANOW, inches O funding ominion of Camada hamad

REPRESENTATIVE IN CANADA.

Entered under Section 30, of the Patent Act 1935.

Manne Olerander E. MacRae, Mahress 56 Sharko St., Ontanio.

TO ALL WHOM IT MAY CONCERN:

ments Dayton, GL EN spectively, residing MESETTT, County gy cr | + Su ta su Fairfield, citizens known Montgomery, invented that County ย⊕ • eq. certain State of Greene, United 五句写真日 new S, States oido, and State CRANCE useful О Н3 CI • O Ç) America, Ohio, improve-PRANCIS rel and

AIRCRAFT SPEED INDICATOR

exact descrip tion OĽ, eqt 944 following ն Ի. ω full, clear

for and adjusting vertical D C C O Hb e con **2**5 1. 13 aircraft the particularly peeds indicator ent tre invention (rate Ç Ç for O Hy ρ climb) relates Ø combined predetermined indicator horizontal aircraft condition of ಧಿದ್ರಾ 1.2 1.2 (3) to means peeds

and the the by measuring which also a novel longi tudinal ಕ್ಷರಿ aircraft arometric static and static one indicates toaqmon pressure, 617 obtained O Hy pressure ernssead ů, the differential horizontal aircraft the <u>0</u> ÂG the @Cts produced measuring vertical latter speed O ⊢÷ Ö peeds the entr bу the Puresente peing peed indicator the rate ø invention Jost of 0 Pitot-static ದ್ದಿ ដូ rate 년 O aircraft O ⊢ÿ mbich ch impact 95 uego O H, che tube, indicates climb altitude obtained provid pressure 0 pue the О Н

ment, provided horizontal instrument डापाउ quio Ь О Н ination Another ರ್ಧಾ **0** ⊬₃ greatly せいいる \mathfrak{P} vertical, standard О Нэ ១៦ រ៉ូ ១៤៥ esodind facilitating elements 8120 O H-j, Ö Fo are ಕ್ಷರ t) () for indleating whereby replaced peeds invention instrument two O !--}, Ω, Ω, an aircraft instruments i-s CQ βð flying single Ç both components provide instru-0 usually one

nolitand required out cruising class 0 means 8 4 1 1 ರಿಕಾಂದ್ರ ۱÷, described, Another the cruising O Hb ಲ್ಲಿ ೧೮೮೨ instrument the ಇನಾತ್ತಿ pointer ಭಿಕಾರಣ horizontal Teaou ሥነ መ 0 0 means 940 pue ct O the provide, eut 3**ರ್**ಬಿಗಾರಿ S O C_t^L Hor LOR 4. TO TO CEED IT adjusting any ç ಶ್ರಾಕಿಕಿತ್ತ ns ni g ω desired horizontal eun indicating instrument euthe scale normal dial -erder and <u>о</u>

98 99 position nodw brawdn Ę B eut Suivip climbing, front 東土たか od: eq1 O ¢-i seven bas ない。 the requirec ಭಿತಾರಣ instrument, downward when the Surantod Sesseatoer whereby ç no Ted the edt said 10°t かばら ξ. 1.3 cruising pointer to to speed increases ರಿಕಾರ್ಥ

ರಾಕಾರ್ತ peed craft and and the Surmaoj Surtaniod pointer the odt 事立たか dial pointer in level dolow al concentrically mounted dial whereby moves instrument Ged " the O. C) ole instrument decreases pus ptre M 3 the toward and pointer cale Strioming. indicator, ##Snozq Another downward whereby newordan edta the 3 dB edt zero pointer ರಭಾಣ 80 vertical ವಿಗಣ t 130 Je quent two Moled O Ho Surpurod object Q N Ċ C that O Hij the when Seid Left c'he eg Survon Tequozizon pointers the はいる **О** Ну diving, മ 0 d D O retatioq 0 ಗ ೧೫ hori FO. on the the ароче の に くす pointer o H Surae TO beeds verticalspeed (d) (7) i di ი ც cruising paraman rotation eny V zontal the 5 5 5 5 airspeed viewed and form, the right t ace 0 type scale thereof desired line invention speed out MOVes Levon rate positi ы О O. Ę 4 node n H MOLI speed, representing SCROSS "Degaid" downward increases, SILB which ch indicating paraman effect, **0** O H susem toun rngo ct D O 013 Ø rate ርያ ትታ climb instrument normally e Ca 如主七九 Surs TOTIMOD the CE O eu1 quont ç ror or men D, men indicator Ø О Ну **Face** provide required Ø peeds aircraft the climbing, single as in diving, بار ال the nortrod adjusting STXB climb 0 000 the airhozizontal speed pointer O 1∹, cruising Butoq ete Ø O H) 1~* 02

craft speed for which the upright mounted instrument when Lorn starts # T# 17 9 <u>;</u> 018 Surganita inverted level Tie chair eut aircraft instrument flight the sircraft 11 1/2 11 eur. "bearin" pue ğ Was flying which starts set, but when indicator t t the the garving instrument WILL desired the edt form indicator alr. cruising 22

gir pointer instrument actuates desired indicator speed dependability Ç cruising the o B indicat Another Buraq which ton pointer, 1snm ರಿತಿಂದ್ರ the o object Tevou Ö eut whether pointer တ (၀ whereby leaks without neans ę, air-tight, instrument the ç combined ror Burraom \mathfrak{D} invention horizontal adjusting are eliminated thereby with () 다 S Fmaerddeip Œ 977 greatly c† O position vertical dial provide in the which increasing ಕಾರ್ತ for Ľ, Ø

novel pag pivoted Sutiputing instrument means indicating straight pointers condition whereby nother KOY, ರ ប្រ 0 प् line Hor instrument desired នឧដ្ឋប [-⁴ 00 ാമ) കെ maintenance respectively neintained diametrically pointers 0 H) reading having ಕ್ಷರ್ಥ may О Н, invention O H indicating ø ø across ပ် (၁ ರ್ಷವಿ ಸ್ಕಾರ desired ය ල ර pointers O Fb j...54 edi Ø ζa condition d O concentrically two factors face tha t Trord when they e, Ω **6**17

diaphragm, Surraddo Surneu the da redtona novel Ω pointer gueens object ω todn pointer, Surphilanz H CO expansion ç provide (ii) Û diephragm knob orra ij and contraction T ES planetary ರಭಣ ر درا درا mechanism ರಾತತ್ವಾ 0 Surraes indi-**0**075

zontal mounted rotating dial by taneously and actuated position prae in the မ္ thereby Ľ, pointer synchronously any instrument SON SON ROL Way ø rotating in its desired Survom -ನಿರ್ಭಾಣ horizontal ¢ DIES ಕಿದ್ದಾ cruising ಶಿರ್ಗವಣ diaphragm which dial the ರಾಕಾರ್ತ fuorqreod ಶ್ರಭದ್ಧ pointer pointer indicated without ct O n D Ø -Inuie VIDIBIT 9 477.0

and and for responsive pointer position, operation broadly, pointer means operating CŤ in any responsive Still without indicated Sueen simultaneously desired euz indicating another pointer, rotating ဓ္ဓ ct O nortreod the ob ject səSuru susem Levon dial instrument and ្ព for D, O Ht synchronously D' in conditions any way edt മ the desired s Suived northearti FOH FOH pointer Buraom Buttating condition ç, 0 H dial, þ Surac H? the operations said desire o ch •प्य condition ß 0 당 provide, pointer

ដ្ឋ pointer concentric desired climb, ಶ್ರಾಕಾಂಡ pointer HOR ¢† cruising single Surad with the indicating air further rate ර ර neens peeds che Noro O Hş object TEREC latter climb and S S dial rotating ರಾಕಕರ Ω ⊢÷ alternately indicator having to g and a horizontal anc 'epraoad pointer the ķ sec and adjusting Ę, TOR pəəds position ¢Ω a dial dial novel indicating dral ተ ከ@ and pointer and For rete combined and rate

vide ¢Ω 13 013 F-9 remote instrument still ratod further **た**近の and О Н) instrument for ಕ್ಷಗ್ ಂದ ಕ್ಷಣದ ಭ indicating class О М for described, the Ç.) **6** desired invention setting remote cruising L. at the o d control peeds -ord

80t which the the and a remote point navigator the instrument navigator t o direct navigator whereby, S. ರ ರ ರ reduced ro bomber molich ೧೭ pilot nedw redmod may, co co Ħ, ď located ron m separate niedniem ರಿಜರ aircraft ន្សីជ S S S g the edt compartment cockpits the なれる Sursing manned by instrument pilot's 6 G Q Q compartments speed instrument cockpit rollot ∺oਮ

pepuedda only however, with invention tion the invention, invention appear and the O. ಕ್ಷಣ claims 979 accompanying F. oull detailed description illustrated, ಗಂರ 6110 0 foregoing reference ក 0 drawings ල ධ, **Stone** drawings construed and other being had fully are [-: **c**† ⊬. ta for wherein hereinafter B which ç O objects よ で い the 90 gaining this esodzna odo follows, expressly end embodiment HOLI esodind the advantages <u>Q</u> taken Ø limits understood, illustration consideract O of the together ው ቪኒ O H

strad Ç, forth struction, example foregoing L. HOH the obtaining the The combination, and specification, ಂದು ೈ ಅಂದಿದ್ಯ invention S) finally e Co results consists location TITU pointed ξΩ **0** C) amoun desired ್ರಾಗಣ substantially odom out relative Ŗ, Ħ fully ij the ಕ್ಷಭ accordance drawings hereinafter arrangement claims ာ. ၁ by way 型工を出 () () (†

rer dž like eut Stred drawings 13 the nierein related like VIOWS: reference STOTOBTED

- 되 다. 명 Н embodying μ. Μ front <u>ដ</u>្ឋា elevetion present O Hy invention; ego form Q H instrument
- W controller Showing Ø View p L the looking from accordance instrument 加工七九 the bottom connected eun invention; OĽ, . 10. ø. remote

mechanism remote instrument controller, <u>р</u>, seen edt Ę, pottom instrument when ia Ca used, View, 2, showing partly £0 connected the بر ت nenner section, C† <u>ජ</u>ූ ල in which the O H setting

line 4--4 Fig. O H 4 ۳, ۵ (A) ρo longitudinal <u>ب</u> vertical secti . 9 taken

line 5--5 五 五 五 五 五 五 O Fa O CA CA 17. Ø ĊЗ longitudinal /40 |---| norizont e. α O α ct ion taken g

ይ F1g. 4; Fig. Ø L₁. ŞΩ transverse Sect မ္မ त्र अष्टि S line Q)

line 7---7 . T. O Hy -3 |--'* [G (i) Fi another 4 ರಿದಣ to Si 0 Ø 0 ca (0 O (+ |-'s taken 8

g line 8--8 CO ω Ή О Н still Fig. • H> another transverse section taken

presd peeds peeds horizontal, desired correctly. adjusting Ħ the invention cruising ಶಿರಣ or instrument when peed normal rate of . व्यव्या moves our **ತಿ**ಗ್ರ in the reinter indicated emoodies, peeds crusing rie rie redto Cownward Ö H, **climb** one) oven t pəəds the the ci O adjustment adjustment pointer to Å speed Suome Ω class the when さた **の** horizontal decreases (A) pointer the Dectroed hereinbefore reduse (7) |----7.847 j_4 (/) Zero ಸ್ಕ 10T things, below F) does noition ខ្មាន ರಾಕಾರ್ಥ position, setting ΩQ setting not ಕ್ಷಣ repurod means stated two increases HOR indicate cruising the the adjustments O Hņ which moves objects vertical tron Ø below single zero

out herein, accomplished, purpose mentioned provided when instrument emf instrument mechanism instruments Its use has Ħ September <u>Instrument</u> instruments setting indicating instruments rotating reissue eut out rotated 30, 1931). given condition of by means Åq front TOT 17, Heretofore, patent would are mechanism in its t, need ct O the present to different the i, 1935 the bring មាន ខេត rotated O Hy widely adopted but о Нъ change 0.10 sensitive **%** whereby only reason Such a the found (original Ø their embodiment Ø 19,709 instrument. planetary simultaneously structure rt ct invention tha t flight by disadvantageous structure enortices. pointers element casing, Surraring or O t net eq 000 and more ettte **c**...∤ gear illustrated នឧប ρɔ sensitive ន ពីព U rotating dial and thereof, o. as disclosed for example ci O in certain types Tevon been train actuated by a knob ಿ ಅ೭೦ ಅ and synchronously Accordingly, characteristics somewhat ದಾರಿದ Ø particularly 1,812,549 ੰ horizontal mechanism provided ಕಗ್ಗ pue this zequiod element rotate satisfactory Jr∙, complete described being dated dated 9000 o ere С Нэ () [-}_j position for the aircraft O H₃ entire with-Œ

けばの instrument tresent ç t instrument បន្ទាធ] invention "Bakelite" 4 lugs Referring ده هر Surseo C C i C 년 0 inclusive, Instrument STEO Ø comprises, 9 Q C ۲, 0 5 Some ಧ್ರಹ ·erduexe (Figs. drawings, the panel suitable Ŗ 943 instrument The 20೮) ್ರದಣ form shown, lightweight and casing is <u>0</u> (trwoths **Dore** embodying Surtunom particularly provided with Ø materia cup-shaped

place by portions the point gecured to Bur spacing stantially and secured together by Suisao 12 17, means 17 S plate insertion where the rods parallel plate members and secured CB **H** instrument о_г, ends comprises 14, and the H ptre Ø ۲. اجا ರಗಳ snap ring 20 H 0 o Fo QI F-i 9 reduced portions ರ ೦ secured (F18. the the out and 16 (Figg. removal neans ço ms rue no em frame epue ettseddo standards 4 o H δ Seta) ıβ and as a unit (Figs. the ω constituted 11, STUL plurality assembly 4 and ₩ 41 ends 17, Ω Η assembly A) pus O Hy 18 C1 0 U. into O Hi <u>ග</u> and 5). Ç, Said gnd and 19 O Hy 13 Å plate Suragu said reduced and out of construct 16 standards i S ರಿಕಾಂಡದೇ standard S) tuiBed reduced apart

a pitot-static and for rod 14 and velocity pressures operating mounted the standard 14. 23 this STXB pressure-responsive in (n the edil. the neans osodind on which the plad Ö standerd edut diaphragm connected standard The said diaphragm TO THE O Fig cherein ton) 0117 position (i) ្ន ភូមិ ភូមិ 14 may 6 12 10 2 ç C roterior (nworks ц 0 instrument βğ μ». Ο2 **ಿ**ದ್ದ ಾರ್ವಾಡಿಯ proportional 22 which extends diaphragm 21 susem О Н, Ծʻ Ф arranged ÅQ velocity ξ, t)je O Ho adjusted Sureq O Fig ಶಂಗ 8810 is adapted to diaphragm 21 ω ror Tor % ⊢ set pressure ct O CĻ Ö diaphragm ۲. 3 streem Ac ω Η, esponse the right ROLOS any dignords conduit adjustably នា្ឋ suitable portion MJ th be mounted selgus S O Hy 13 peed S) 8 0 0 0 ct O

the rear wall terminates the casing F bue O. Surldnos 9ಗ4 ប្រ portion 27a Surseo Teducer 9 and has a inside (C) MO LOW 0 portion 26 extends the casing. exteriorly

angle through an opening 34 provided Burea on the opposite rock shaft in Fig. 4. Rigidly secured to shaped member contraction thereof, of T thereto rigidly pa urd ø Motion 23 crank 3 [--رن ښا 88 connected <u>ತ್ತಿದ್ದೇ</u> carried Ø having on the O H journaled lever the O Hý E CO ъу а ರಗ್ಗೆ 0 o c diaphragm 21 and one ann diaphragm transmitted 31 which 디 the plate gear the D F the rock shaft 28 slidably said 21, ñ is arranged plates sector rock shaft ct O the due plate Œ 2 the rock doing SS ಗ್ಕರ £3 notenedice of and Suissing 12 (Fig. o'cher ct O (X) N N shaft C) ದಿಗಾ projecting slidably μ. Ω arm <u>o</u> as shown 23 located e) e) ଧ Ö, 댝 and oul

held journaled in said gear which is journaled of the shaft portion through journaled in the stationery another noiniq ् the 38 for မ္မ gear plate The plate plate çə roon Boon 37 there 1000 1000 Ç) Suinsud Sartaoddas Ë plates carried 11, 8 c C D o Çş ∯> <u>ار.</u> ا sector 43 and carried by (Fig. 91.7 91.7 3 ۳. س Surgeo 44 secured 11 and e 13 cm g provided said shaft latter დ |---<u>0</u> ដ ខ Ø carried by တ hollow shaft 12 FJ bracket said Кq other Ø Surec ರಬರಿ pus a Gear န STROM Rear fixed plate <u>ن</u>ې pue |-/± {Ω di Ø shaft provided with a മ O Hy 39 which meshes arranged eteld ೧೧ shart Ö, carried by 37 which ß **با**ک which edt threaded Çı) H≠ S one end 45 which other to mesh Surse j-4 (0 (되 Stoeford journaled द्रमध uīd end OH, Oī

certed a pointer minist 49 which extends noinia 🛽 47 which meshes Carried ಭ through the bushing 44 and on which is with and secured (:) Rear င္ပံ 48 secured to a hollow ಂದರ ರ್ಷಕ್ರಾಹಿ shaft

plate ll. shaft 37 and prevented from rotating by means of 48, one end lash in the ring gover glass 11ng 53 which sting scale rotatable dial to indicate air speed. A hair 52. The by means and held on said fixed plate The pointer ដ က္ခ of said hair spring being apring 37 gear train between the <u>al</u> 80 front Suir 976 **О** through which remou Ø visible, forms ्रहास्ट O Ha රා හ is provided for 50 cooperates (Figs. the end The R T T T T Ø cr O casing bearing surface the cover scale 51 the (၂) (၂) Ç) հ'> notuiq and 5) pin 58 carried by the Pointer 50 and ⊢∗ Ø OUL いれた社 യ closed is inscribed ු] වූ පූ පූ by means connected 8 dn Suryer threaded journaled on the fixed Spacing one ω Hor scale preq Sureq Ŋ the Bura o O प्राप् said dial ರ ೧ Mosd ent its coopergear T₂ S S the ဌာ (၁) S Surpeda (阿拉思。 1) rixed (F18. Mollow Ω M ۲. ت

counterweight 39, 40, 47 and mector 33 and contracts upon changes mitted to **6**47 0 (1) エエエル に上田 th en 59. rock 44 00 • speed **(**) e UD The न उत्तर प्र e CI seen that indicator portion of reautor TIB BIR structure 100E **1** whileh sector 33 speed its ପ୍ଧ as the diaphragm 21 Suth in turn actuates through 다 의 u. movement described conprovided the 0 11 0 Cear Tean instrument in M นุร รุณ อนุร expands train -Suert ್ಷ ಕ್ಷಾ

rate place, At the gide glidably Or diaphrasm 60 portion communication Sursao device terminates a heat The inside perused usually equalize formed pressures 6 O, which insulated 9 point where the O d O eqq climb extending connected i i ಭಿರಣ integrally The t:le there 901 H Tree of the casing 947 (Figs. erta edt ξģ は立たか instrument inside instrument stendards Surrano N N usual manner end static tank (not interior diaphragm -of-climb through and provided conduit Stati μŞ O. mi ti ವುದ ptra ω said emssead S S portion 67 ু Ô outside member <u>o</u> Strdmos <u>(i)</u> ထ Ö, pressure Ф 4 shown) 다 이 8 19Mord means Surosds φ which is capillary tubu Lar said when a change terminates capillary vertical-speed <u>--</u>-တ nortion <u>Q</u>, O Ho Surmon arranged Sursao Buther by: Spor ω රා රා the inside member mounted pressure the terminating susom conduit diaphragm 60 tend edua F_S O H Buraq in the ಇ.ಸಾಹ ß OH Fig ends O H O H and **と** Ø nottrog ဋ 1011ď ဓ္ဌ 00 indicating euz -responsive altitude secured commection placed ф Ф Ç, о Н, \<u>\range</u> Surrdnos ÇŒ through commection casing which g) ಗಣಂಗ inside (Fig. which tube 66 outstandard ct takes are <u>o</u> p. ct O t o

pressures takes through altitude expands place 943 9 When Lidan Bureq ια Μ capillary the ço well ent ಅನಿ ಬಾರು înside an TIMOTIN 9Summo indicati 61, r T pand the rate ç Ç altitude 片 outside those altitude e, che at which skilled O Hy takes eut rate Ceases eoeld meandain भप्र O Fo mhereupon change equalizati **ट्रा**प्ट diaphragm equalize Б)

sector 78 and pinion 81, Secured to said end is a pointer carried by the plate 12. connected to 85 is provided a scale 84 inscribed doing to bee one end of which is arranged to mesh with a pinion 81 carried by a shaft shaft 80 journaled in the which projects to the rock shaft diaphragm 60 provided with is carried by a gear sector 78. M at an angle angaging a U-shaped member 73 secured to being effected by means of elso journaled in the plates 12 and 13, and contraction, Movement ಕ್ಷಗ್ರ pag extends ß ct O through an opening 77 thereto counterweight 79 shaft having its μ· (Ω 77. take up the O Hu transmitted journaled in the plate on the fixed plate 45. ಗಣಿnoಸಭ್ರ the **છ** A lever 75 and is adapted etto fixed plates 11 pue diaphragm 60, a crank having one arm 72 slidebly other the hollow shafts end of भुरुष्ठेष eut o ch **0**41 and 83 which ርያ ት'• other arm 74 rigidly Ø lash between tho said hair spring being ⊢'• ta gear sector 78 in the plate secured rock shaft to engage a the transmission due end carried on a the center seteredoco ST pure 2 ် पार्लं छ ०२ A hair 0 and the ዞ የተ 37 and ಕ್ಷದ್ದರಿ 71 ಶಿಗಡ connected 12 and which pin 76 which nofeneque rees Ϲı Ø Surads rock shaft of the with stub က **က** လ redito

TB noing bas 85 by means expands and contracts due vertical of the speed, it will be rock its movement shaft o C seen that Ω e tet |-J+ €2 transmitted of change Ω (3 the 75, ್ರಡಿ diaphragm 60 in altitude edt ot sector pointer

secured to said shaft the casing abuts the wall ghai't In diving. against the and secured to accessible ora 'Surprise gs viewed in Fig, to a horizontal position, me air speed decreases below representing the desired normal cruising speed nd pointer 50 of the is arranged for lieans from orte edt uI compression Beaour eda of a recess provided in Ю 9110 the front sinaft cruising speed 1-1 E Cra other now provided for nedw prewden whereby air speed indicator ထ longitudinal sliding movement හ O Hy **Shown** (1914) • 1914 • end of which abuts et te of the journaled in the œ gaid coil c† (1) (0) 4 1 1 1 1 1 said means the pointer pointing to **₽** g instrument pointer moves the pointer and the number the cruising speed, Surads adjusting 8 14 13 scale 다 o 99 estramos 00 peeds Sutseo lower (Figs. to Ø a collar one たいぬけ **6** O. Ta deta preadn increases, end TOITION H 0 H as in O Ü dial 52 1 and t dBnoad S Fo therein 90 gny the *#*> O H 87 Left

rotate revolves it the common of the gear the shaft 88, in the lower portion of doidw 38 tlade deem of peguerna 43 on due BXIS o ct plate せっている carries with it ರಗ್ಗ said pinion 92 meshing is parallel to the shaft O H5 सर्ग रम shart 4<u>1</u> 10 ۲. ۲. granetary the pointers causes petarec m **0**0 the noiniq ω H: ф ф ф action between the casing provided a ರ ೧ ೧ <u>လ</u> လ bracket 42 gear 50 and 83. **1.**0ಸ್ರಶವದ (F18; Ø 片 in turn with the 40 which 16 doing the 88 and is S S S * c† 0 carried <u>ς</u>† D CO some manner as **⊢** Ω Endil. and revolve terior teri caused will ch journaled g 10 rotation gear gear about Ċ3 H^l*

fixed reference to a horizontal senting the desired cruising speed amchronously one dial ring Tth the dial gatting movement mare is provided another pinion bo gear 40 is 39 which at through the to accurately determine g this 89 Sura the with the လ (၁ this manner produces rotation of Sears marker position together of the pointer. Ç) time scale caused 4 ις |-so that 95 pointer and ~* (4) relatively (T)-00. ţ o ct 6 th o rotate when the knob 87 is manipulated, 4 upnord ed thereby <u>ტ</u> <u>.</u> 94 which is However, 与いる 00 horizontal position to which on the scale 51 stationary. that simultaneously and Suronpord 9 III erent the number on the shaft pointer þ Ω Ή; the pointer engagement the Rotation provided ំ ១ is brought required 93

tion. Wise Same gear Pig. 16:25. ratio one clockwise clockwise the tion in a guch that and the ratio For example, move in unison in gears 39 and 40, gear 52 3 ഗ revolution of 0 that ည Baing ಸಿಡಿಲ್ಟ which must che l⊶ c† revolution of gear clockwise 3/5 الما الما (which ۲. ده if the gear 47, Gear 0 final ratio between O H revolution because these **0 დ** |-|0 gear to be understood Sears TBOET ಸ್ಥಾರ್ ಚಿ Ø auch equal angular amounts in the same pug stationary, 200 carries (Pear revolution 43 makes direction ratios nr Sureq å ₽ 47 to gear 48 **4**) <u>ರ</u>ೂದ್ರ 47 and 48, 47 or Will ratio of and the scale as examples, for 40, one clockwise that make Cear mesh with on its for 5/5 counterclockwise eno that the Cear they gears Sear 39 to gears O Ma 40 will 3 75 revolution of (n (n 51) own axis. Ċ, Seare rotate 47 will likewise also M 80 A O 다 는 6 Rear and pointer 3/5 Ø ಚಿಕ್ಕಾಗ pro eyen WIII pus revolution about clockwise 3:5, () 4<u>1</u> Coar 47, og S together 49 13 13 ratios and 52 will 3/5 ್ 0 9/25 Then then the former 8 Cear ರಿದ್ S S seen from one direction <u>о</u> μ· for 50 w111 O Ha revolut sum the neemded on the Sarre make Ø ÇI ÇI

by the viewed ton of knob 87. direction as will move large in equal Accordingly, ratio between gear of the instrument, one clockwise of large revolution revolution rotation erried. revolution in a onode siza motation produced by revolution direction C ESS shaft in Fig. 9.47 9.47 ಭಗಡ equal goar mous, increments 16/25 counterclockwise. the o ⊢, 43, counterclockwise large gear TROE 35.0 Viewed O Ho (୨ ୧୯ ୧୯ ζγ Έ revolution of Sear 02 03 the e ç (V) 다 e clockwise direction О І-ь Rear 52 make 16/25 ಂದಂ ಆಥಾಗ gear 43 net o E E Hence, 48 clockwise 200 Done Sa æ rotation of counterclockwise the bodily in the in Fig. revolution 40, clockwise and Ç3 result being |-|-|-|-|-45 makes and doidm do gear. ್ರೀಖಗ pne that same gg CO ಗ 0 ಗ 0) になる記 म्मान scale previously TEO S 848 ර ස to V JE95 rotation rotation HOT: eno revolution eno i L Hence, direction C) TROS. pug |-[1 けれる 50 ÇϽ H () clockwise one clockwise 1 minus (1) (1) revolution el celtrise Š when viewed clockwise 16:25, tequipod Ö þ Sears viewed namely, requioc 1-24 (0 one O Pa О Нэ stated, ದಣದ gear ದರಿಗೆಜ ವಿದ್ಯಾ a differential 400 ଉ/୪୯ Rear clockwise revoluthen gear ಕ್ಟ್ ಆಗ್ರಡ E E CT O revolution revolution in 910. Ωı Çı 9/25 elockwise i C direction 50 actuated additional **4**6 from BOVe or 15/25 tine **DOVe** revolution carried a clockwise <u>7</u> with (A) O. ringl the ÇЭ _____; ≾ КQ O H; Tront euz

horizontal with the Ħ cruising position to peeds ecterence អូ ភូ **ಸಂತ್ರಕ್ಕೆಂ**ದ way ಸ್ಟಾಂಗ್ನ indicate <u>е</u> O. 220 miles flight marker 95 pna example, thereby when the a cruising , 88 Entracting .mod red Ę HOH said pointer TIES. pointer peeds لسا the |-; |-; level (Ti O H will 947 947 ⊢' α scele approximately flight ۲, ا alroraft Ф Д alignment Ş ri Fi بار. (1) g ct 00 Shown should

move downward from its horizontal position. what cruising speed is to into coincidence with the the dial ring speed will increase on the other hand, if the craft pointer 50 the air will move რ დ speed will any number an d upward from consequently the pointer decrease reference marker 95, be maintained for level 8 **6**47 8 ao the and scale into horizontal consequently 51 may a dive Ş depending upon . noition be brought rotation edt 50 will flight

in Pig. be adjusted to coincide with edt neemted Then through actuated by II in a manner operating axis, or lowered with respect pinion 96 that upon rotation adapted to the end of said shaft a gear 97 carried for manipulation said means comprise Wiewed in Fig. 1. in a horizontal 98 redmem refudut said the e Н knob 87 Means and and gear 97 the diaphragm 60 zero engage the **Hook** ome notenedies the Ö noitisou pointer similar e is position and pointing position thereby рў n H located that shaft interconnecting transmission mechanism In the embodiment secured on a shaft O H also pedsug the knob 87. a pinion sald lower portion 101 of 98 there is c† <u> Sarəq</u> 71 and the will be c O causing actuation of so that provided for adjusting the that to the contraction 다 다 여 inward Cam 98 which is 96 also its zero ct to when the 100 by support mben ಕ ಬ್ಲ \$\d supporting plate 12. for level provided O ⊢ņ Said pinion is pointer 83, tdoir said rock horizontal the illustrated in perared toward O H₃ t o position on the scale <u>ග</u> |-24 (/2 pointer journaled casing, to <u>ಕಿಗ್ಗ</u> व्यम् adapted to be O Fy and along its flight euz Ø eut the cam 100 which edt no the rock shaft mge unique ib the shaft 71 म् इठव् (O) 87 through the noition adapted, tagira scale it will latter may coincides Ħ shaft ည ne sh the drawings pointer 0.03 о ц 60. raised

horizontal position 51 into number representing and synchronously rotated therewith a common a horizontal position. will means S O ပ (၁ i. for bringing seen that actuated eug S illustrated at desired cruising speed the the both pointers COUN dial ning 87 and shaft in order ය ග ಭ ಭ and 50 (a Eniro or and 83 501, on the simultaneously ස and when into constitute scale

rotate 88 is movable planes and positioned is in mesh with Total end namelγ, speed dial or vertical gear sectors 85 being connected to the respective ruck shafts exes of said diaphragms, shafts 21 and 71 positioned at вствет Да each other. fixed relation that the Of, di aphragms H 96 လ လ ប្ទទល្ជន cranks plates Also, พาไไ 다 다 0 ÇI ÇI ₩. axially (∆ V the in the Cear ಶಭಡ ्रव्या out rotatable ला हा ෆ් ග EF 6 foregoing description, S ch (C) ry W 78 further 8 deem ro CQ CO casing 9 pue 87 ۲† O and ψ. Oi prie and s mga rniqa î.b as to ರಿಗಿ ರಿಗಾಂ () |---two positions. thereby 74 ජා (ර) is fixed while the horizontal 60 and the equirograde pulled Q C はいてき ct O apparent that 0 13 0 right angles expand in substantially perallel ß cause concentric causing pair OLB mounted gear 97 while manually outwardly respectively in directions ထ Ö gear simultaneous ್ರಾಣ್ಣ 占 ŢD. († |-} the parallel **9**40 pointers 50 trains to the operable shaft w111 relatively О На rate-of-climb 92 and 94 position, the Te notnid dSuores operating there connected towards casing, seen ť

dial 45. ret rugged and efficient. rate of climb diaphragm gear 97 to 91 is demeshed from gear 92 while the knob 87 is pushed W wile the diaphragm 21 remains he casing 9. processous edII 60 cause setting of and pointer 83 structure thus цŢ operation of cam 100 to thereby the second position of the euz without cause a air inwardly peptvord retuiod peads setting movement rotating diaphragm 60 or notnia stationary of the ⊢. Ω ඉ raise or lower compact, esing, [-'• €2 shaft with respect to 50 and its dial meshed with O ⊢į, simple but **,** the pinion namely

with an to him. to the pilot or bomber, пау located in from his desirable and pilot ur Lequod **७**५५ adjust prije 103, casing 9. o O extension bombing planes, For this notatsog instrument addition to the to provide means 0 13 0 HOR On larger aircraft, (A O the latter being the cockpit of the pilot, the a new cruising speed by manipulation of in different sesodind t ne mura ent 102 projecting out To this 日の口中 əsodznd Tenad O Flj |-/* (0 there faction, the extension embodying the on which a desired manoeuver, whereby cockpits. remote of sufficient particularly is usually shaft and a control device to be maintained edt mowl the navigator or bomber eun 93 is connected a of the 0 the 다 ct (Fig. instrument is that present р. В a navigator navigator length instrument panel fighting lower 3) is ⊢., therefore, Renerm invention provided accessible flexible he may reduiod ro rotestven craft mounted c† O

ment at the a rorm gear dial ring to the navigator cesing 105 actuated by means provided with **is made** to project of which the shaft to indicate maft 103. thereby operate flexible shaft 55 and cooperates with a eq1 106 pilotis **6**47 are are 102 i Ct the Surved desired scale ც S O H₃ euz through a casing 105 S terminates Sucturd comber's instrument Ø pəeds 107 യ പാ remote worm 109 secured cruising the 1-4 (2 scale 80 end, instrument visible cockpit. in a crank handle and 94 panel has thereto provided on LDS. speed for which the fixed reference <u>は</u>100 woa'r and flexible The ធ្វា The may be ائر ال ಬಾತಿಂದ dial 107 which are es 947 worm gear 106 which remote the front set. plate actuated ತಗಿತ್ತಾಗೆ ಕ 104 by means flexible ۲. ده narker O H located ÇŅ V) instru-103 r G Llo С С j...', (2

mounted at a desired position of which are rate of climb that both pointers instrument of the horizontal provided novel Wertical speed the longitudinal speed indicator ct O and There form, (S) concentrically r L cruising well indicating Susem or rate of which is F CD alignment or horizontal speed in effect, B S enda | may be as the #or, a H ್ರಾಕ್ಕಾರೆ, provided ಇರೆಖ್ಲರ್ ಕಲೆ nortrod speed indicating portion adjusting adjusted to reduter climb thereof. for ρo pivoted said single hinged a condition of 0 Ċ C a novel of the pointers the ርተ ወ the end indicate O Imp Ф О dial ಕ್ಷಭ an aircraft instrument pure Ľ vertical There Bureq deques ω and pointer means indicator simultaneously compact level horizontal ಅಭಟ concentrically O ⊢\; О Н to peads £1181t in order elso ಶ್ರಭಾಣ aircraft the 941 947

wount and for indicating Mirait starts he hinged indicator will form of the instrument Further, TOT Tovel diving, the indicator will form whereby, Ø means are also provided for desired the anden cruising speed from setting an upright 9000 aircraft cithe remote point. $^{m o m}$ and when the starts climbing, an inverted a remote setting

sitimeter, tachometer or manifold tion of the limits speed indicator the actuating device may be applied ously setting a dial and example, mithout departing from been illustrated and described, various changes TROQUE WOR IIV estions in the therefore, the novel mechanism for Although only one embodiment C C form and relative О Н ೧ be had to O Իչ ct O those 907<u>7</u> any ර් ල ම pointer without moving or disturbing skilled invention indicatingedobs the appended claims О Н5 simultaneously 5 quesusans pressure the to an independent the art may be instrument such as an of the invention, O Fo JO T pus parts, which and modifi-Reference epeu synchrondefini-

AN CHARLE

condition position by said actuating device condition said pointer with respect bring the mbereby actuating device relative and synchronous comecting mounting said said actuating device cooperating with said instrument including a to said device m instrument board of be mounted, said pointer indicates C† of flight pointer into Bald The combination in an transmission means connecting sald flight, ဒ္ဓ to said dial in said casing, and gear means いって and movement pres dial setting remains casing a departure actuation by of the aircraft dial and representing a Surseo and dial may be rotated and pointer for causing pointer, in said casing, the casing adapted for mounting an aircraft, an actuating device, and in equal rotation H stationary in said casing same Lor elther 0 Mong of means នធារាក predetermined position any desired reading of the latter, aircraft thereof direction said predetermined on which pointer amounts means fixedly mounting nosinu ni said pointer indicating rotatably and a dial from said the instrument predetermined thereafter so as to while simulteneous inter-

may be rd thout aid desired reading tial and condition of a predetermined predetermined actuating Surperadooo ram mereafter the instrument by said Burring. said actuating instrument setting rotation rotatably pointer, instrumen t Saribulang Ħ rotttsog equal rotated interfering actuating Salo pointer transmission The Ø Sura unom device Ą poard including planetary flight sgunome Sald combinat nosition Surgengos indicates may Q Q device Ċ, condition यं ने मुख O H Hor sur smer thereof co co device, SALO said ୍ର (ହ actuating ttiw : Ġ. t o β P D Sursing said mounted, reon ₽ 0 ₽ डाराह भा HOD. casing なれれば alrcraft, the the cial bring the retured device ø p H the stationary r L adatit to actuation eantane whereby pointer, train respect ones nosim connecting CIB device actuation simultaneous E, adapted an d Ę pres aircrait 0 g direction interconnecting Salo Saic pointer movement <u> ១០1 d</u> relative S, O ç, HOLL 占. O H₃ 片 actuating casing, TOT: said said either **e** प्रम pointer Ö, Seld means fixedly casing, euthe ៤១ខា នុងក្ល indicating optri Turramom ಶ್ರಭಾಣ said latter, aircraft while e Fa Ċ C retairod Sursao Casing oue and device predetermined direction synchronous means said said casing the **ರ್**ದಣ retniter Said susem said representing t O dial and ror ಭಗ್ರಭ emes retuter 8 C) 5 ω which any Ø from

responsive to the horizontal desired horizontal cruising speed. means for setting said pointers the combination of Ine across the of said aircraft for one of said pointers, In an aircraft face two <u>С</u> actuating means responsive concentrically the instrument peeds speed of indicating the other so that an aircraft for actuating pivoted pointers, c† O ror they form a horizontal of said pointers, instrument, the vertical level flight pəəds (ያ) ኖተ and

me of said pointers, responsive to combination of two horizontal the face of mid pointers so and means including an axially shiftable shaft for of said aircraft the an orwising speed. the eht eut eut aircraft instrument for actuating that they Letnozizontal concentrically pivoted pointers, means means responsive speed indicating H Or H form a horizontal line peeds level flight the other of an aircraft ct O of said pointers, t ne instrument, ct B vertical Ø desired across for actuating setting ರಿಕಾರ್ಣ

line of a pair of concentrically dition is my desired reading of means for setting said pointers so other factor for actuating for actuating one of a desired condition, indicating two diametrically maintained In an indicating factors of said SECTOSS Suripngianos said pointers means pointers, the instrument, the the other pivoted Face responsive c H that they form a straight Susem ç Ç pointers O i→y den the the maintenance said ct O responsi ve out ins trument combination 9 10 9 for respectively pointers, desired O H₃ Seid to the factors

ECBOE Surgario el 8 zontal cruising **Line** diametrically actors for actuating in opposite the first to the vertical eno Burgana responsive to wastituted by said pointers or setting said pointers responsive to of a desired mdicating two of two concentrically pivoted pointers combination of auross the face of the of said hinged for HIE LON В setting said H directions pue condition, an aircraft minen Lon the B of the the other two pus factors Ø peed indicating CIB CIB ರಾಕಾರ್ಥ pagain increase TIB horizontal graem indicator concentrically 947 inverted "v" across increase arms 910 O H₃ and form desired Sutributing for arms instrument neens factor for indicator including an said indicating instrument, o G O H₃ to O the în horizontal instrument, level ξΩ O 12 13 店at said pointers, to peeds said hinged race T T responsive to aircraft condition an upright "y" that when the œ downward flight 년 0 년 they direction pivoted Surven actuating of the they o ct gmy axially an aircraft TOT: mro r <u>tř</u>e rol. the maintenance න ෆ් fpeeds (A) is maintained. Torm aircraft indicator in desired pointers, instrument vertical speed, respectively combination actuating Ŋ susem one ø 017804ರಂ ninged the other desired when ¢ shiftable straight neens O Ho the horizontal TOT readings of ⊢• 0 said the arns means Suratp ç O eabousive duiod bum t De horiline aircraft that shaft cher prie О Нэ

B diving monizontal cruising point in opposite morizontal line across the wounting the other miftable in downward vertical direction opposite responsive to drection for ero Burrand responsive wonstituted combination shaft Ö S S Surdmits Ö S P the 古 e an increase **산환** 0 ល ROH aircraft the pasury directions horizontal vertical d O concentrically setting said arms so that peeds To man the pure speed, SULE that indicator having indicating and form O Ho in horizontal face peeds O Hy said hinged inverted "y" when and means for level speed said hinged the first O O Hij pivoted pointers, O F-3 tubizdn de eut said aircraft including E E 111grt indicator instrument une speed, means indicator in its hinged aircraft #o# they せばの CĻ (g 14.6.11 E E ğ H and nen Lon aircraft mioj increase axially desired Susem arms one ertae

to said actuating a pointer, an instrument instrument neens means rotatably fixedly mounting and a dial simultaneous whereby said pointer atationary the same direction while mison relative for bring the pointer into the actuation device in either condition of said pointer mth respect end means end movement the aircraft a departure setting said Interconnecting The including interconnected with cooperating with said transmission means r L Hour and ct O ę, ខ្ព To bracd combination flight on which the 010 ဋ mounting d O said 321Q 3010 said pointer synchronous setting said actuating device 1310 said direction from said position device said casing Surse ಕಂ ಶಿತ Ø dial and dial may be rotated pointer thereafter casing said and predetermined an aircraft, casing adapted for mounting the ც ს said actuating device remains said dial pre pus pointer maintained instrument dial same Ame and ដ្ឋ actuation by connecting by without representing said last ತ್ತಿಗಳ aircraft pue predetermined pointer, said from ij in said an actuating pointer desired reading of condition rotation thereof may (D) equal actuating interfering E' O mentioned said said andicating by said be mounted, remote the susem lo said casing, casing, ß amounts NO. predetermined so as to reading latter, retnioq position indicates Sursuao device, actuating point. device, flight, Ç negre ಸಣಾವಿ H, βď Ë

of a desired B maicating two of two concentrically pivoted the other pointers is pesitions redute end of desired condition straight line Suipulou streem pur for required whereby in 占 ú manually Sultanton S adjusted factor eondition, setting SECTORS factors indicating ļ.ⁱ (A) ಗಿಂಚ one maintained, the face adjusted. and operable 9110 said pointers Sartno tatuos means actuating position of in the O Hy instrument, said responsive pointers O Fb shaft other the <u>ಇಲ್ಲಿ</u> ಕ್ಷು pointers, 8 န exially ខ្លាំ instrument position of other last-mentioned means ರ್. ೧೭೮ Lon that the ct O shaft eonance naturam respectively combination ther one means responsive О Н_э movable said pointers **O** ⊢}, one ಬರ್ e maol said, shaft Said Ö, ¢ ¢ ectio Salo

of two concentrically pivoted pointers line diametrically means for setting factors desired condition to the other of a desired condition, mdicating a remote Last-mentioned for actuating one CALO. factor garod, ractors indicating is maintained, said pointers SSOTOB G L Susem Suripuding neans actuating Ö, for the instrument, ಶಿಸಿದ್ದ race responsive setting to O and means <u>ಅಭ್ಯ</u> pointers, O Hy that they ರ್ the of one other the for the ci O 0 instrument maintenance respectively combination interconnected with O Ho means etto nto f said Said **O** ⊢\ យ responsive pointers said straight pointers, ದರಿಗೃಷ eun

얻 line of a desired of two from SUBBIL to the factors pointer has been set. indicating desired condition is maintained, means interconnected with indicating last-mentioned means diametrically Д С concentrically pivoted pointers other remote TOT setting two the actuating one of condition, Fac tor 'ಾರ್ಬಂಧೆ factors condition indicating ននា<u>ដ</u>ំល 880208 このよ and means contributing pointers means actuating the other Tor the rior. instrument, said pointers, whi ch responsive to Tace setting C, 80 said remote point for said O ⊬₃ なばばれ ct O etto the roz 6प् th e they lest instrument of said pointers respectively maintenance combination means responsive 900 Ç, mentioned e maoj said pointers, <u>о</u> saio straight nertw adt

eno Sur 13. responsive a horizontal pointers, speed of nolination setting 111abt interconnected O H) Said said aircraft Susem d O ದಿಗೆ ಅತ Ç, 83 line horizontal speed pointer from c. Ø the horizontal two ±o± aircraft eretator, က across desired concentrically pivoted setting . With for actuating ರಾಕಾರ್ಷ the face means 28210 horizontal said pointers ಭಿಕಾರಣ indicating last-mentioned responsive Ö, O H₃ the cruising the an aircraft other of instrument pointers instrument, so that c† O a remote the means 'ರಾಕಾರ್ಷ Said for actuatthey form vertical ±, Or neans · turod pus **e**43

from a remote point, muising spead, so that they other of said speed pointer has been indicating the mentioned means the instrument for actuating one e A TSuodse a suse the combination of form a speed цв ,saptutod for level flight cruising speed S O means interconnected with ţ р two O H3 setting horizontal line the horizontal speed sasem bas said pointers, said sireraft concentrically pivoted pointers, Susem ದಿಕಿಕಿದ್ದೆ said horizontal for ಗ್ರೆ 다. 교 indicating р С† said setting which F) OH means responsive across desired horizontal remote said horizontel actuating the C H pres said lastinstrument, the apeed pointer ය ස point for face pointers aircraft ţ,

of the rate-of-climb operable of the rotatable the setting movement We sir speed pointer, pointer, MORING TOP pointers, pointer and and rock shafts the rate-of-climb wes of said diaphragms, Sugardans 8TV8 mir of parallel rock to rate-of-climb fowards each lel planes dephragms mounted fo moination of ç susem change means returog Causing means OCT B In an aircraft other, arranged and positioned for alternately HOH HOH positioned at right in horizontal respectively a casing, dial for actuation thereby, 0 and a setting pointer, ವಿದ್ದಾಣಾ 940 in said casing in substantially paral. pointer C C Q.B concentrically with rotatable simulteneously and shafts susem the O P aircraft Ω βÞ indicating prag Ø pair 80 88 Ø air pair movement end the for causing separate rotatable dial connecting said pointers 217 respectively Suit and on dial speed pointer, diaphragms O Hij and to expand Of, ರಿಕಿಕಿದ್ದೆ concentrically pivoted angles pressure-responsive ಕ್ಷಭ setting means Ċ, instrument, setting movement of Ċ, the rate-of-climb Ø the other being responsynchronouslyø said stationary stationary dial Sureq said to the setting connected in directions for the setting means an d aircraft, earstandine operating S C manually movement 4. 16 с† 0 कर देख said HOH

an axially movable of the air simultaneously means e Surene setting movement concentrically with ter, a rotatable actuation respectively connecting diaphragms, parallel rock auch other, md positioned of chilab of plenes and dange in daphragms combination TOT causing eneredes thereby, horizontal peeds 검 positioned mounted ದ್ದಿ 鈴 an aircraft 900 rate-of-climb B rred pointer shafts and synchronously ø at right O |-5 aircraft e G pointer, dial casing, Œ shaft SOLO setting movement Ø C, of concentrically pivoted pointers, <u>ಇವಿ ೧</u> 9 1 setting stationary respectively air Tor 0 pag said rate-of-climb pointer, said pointers angles end the smgs rrids in for alternately stationary SB æ indicating speed of and the rotatable ared reduioq Sursao movement င် ri B manually ct O exp and dial Ď, other **With** the in substantially ಭಾಕತಿಂದ್ರ Sald connected Sureq and the pressure-responsive dial, of the instrument, ror О Н the Sureq ct O r D operating operable aircraft, the edt pointer Surrantos the rate-of-climb poinresponsive Said rock directions means setting 317 setting rotatable responsive ct O ង្គ្រាញ means ರಿಕಾರ್ಡ means TO T and axes m movement 9 Q Q means shafts parallel to aled Sursnao pesusara ç O suce and sin towards ROZ pointer, O Fà incl uding dial susem rate setting JOI

of said rotatable Sursus nor while its actuating Sur causing in concentric wely rotatable dial fixed dial for ly pivot thereto, said diaphragus in horizontal numb of an aircraft amsernquib publication of a casing, one pointers, novement mounted മ ø or said な数 relation with said fixed r B B simultaneous setting . ೧೭೮ aircraft dial. To beeds O H rate-of-climb means respectively H. ਸ PO∺ diaphragm remains and the diaphragms នុខ ្លា said movement for said actuation ស្វ indicating zred and synchronous setting movement rate-of-climb pointer, sald casing in normally other being O P air speed pointer Buroa of pressure-responsive aircraft, indicating thereby, a ្ឋាខន instrument, relatively connecting responsive dial, air responsive ಸ್ಕಾರ್ ಕ ಶಾಂಕರ್ಡ relatively pointer, neans fixed of concentricalt o retarod betauom bas said pointers fixed ensem bus HOY. relation ct O rate-of-(i) causing rela-

movement sue means movement ably mounted being fixedly dials to said bransmission mechanisms respectively of concentrically pivoted **pre**determined oviencisa Enled ь. in normally a casing, æ related to respectively devices O H O H₀ for causing ρɔ H edt the pointer which fixed relation thereto, pair of therein, means factor mounted condition, other FO. indicating ct O edo actuating actuation contributing Ë retured a simultaneous indicate factor Said ω pointers ared instrument, for causing a casing and cooperates by the devices edia and the other O Fij Ö, the two related cooperating concentric the maintenance one and and latter, Surtoeunoo rotatable mounted the O H がえたか synchronous eut separate 98±0 combination being responsive one Sursed reduc the fixed dials, 5 with factors 0.101 said pointers devices e, said setting said sald Ö setting a pair casing 0 diel, rotatdials

actuating said rotatable synchronous with the being rotatably mounted dals being fixedly dals to said devices pair of concentrically of a predetermined condition, waing in normally menselon ramponsive to #wices being of a casing, S respectively fixed dial, setting movement dial, 占 setting ared e Suitabing us mechanism eatsuodsea Ω Q = 2 TOT related ಶ್ರಾದ fixed relation last-mentioned means o O actuation by mounted movement of the common means means for causing indicate actuating respectively pivoted therein, factor to one 8 instrument, ロ eup Ø ರ್ಷಕ the two related statated Surgndiateo pair of factor devices mounted in said 10° means for the latter, pointer thereto, other Sursso connecting said alternately Ø oue the concentric cooperating from the simultaneous which retaroq @110 **6**077 combination and the other Eursing t one Ç, the odt factors, Sured Jerns cooperates O Hy pne said exterior pus dials, maintenance with DIES pointers at will the

movable mommon bias common means movement of TOT SIBBE ment of petruoz derices fixedly mounted echemi sms of concentrically pivoted pointers orespectively indicate predetermined to a related tising in normally ev isnodsea Susi of a casing, last-mentioned means rotatable therein, HOH causing respectively connecting said 占 means the returod actuation by for alternately factor ared e an indicating condition, other pointer in said means for ç Ç shaft. മ Sarpartaur rixed which cooperates simultaneous eno <u>و</u> contributing actuating Surseo factor Tron tra e the two related ø relation ared causing a instrument, ω and at will latter, edz manually operable pus and the ಶ್ಚರಾಧ O C ರಿದ್ Ç O devices mounted th e exterior thereto, **ө**цт cooperating concentric dials, 0 1 1 etto edt daim separate synchronous rotatable other other being responsive the maintenance pointers actuating Ö Fij factors, 0 e E combination said Sureq 6117 fixed dial, setting move-선구구교 Ç, dial, and setting dials to said in said Sursao transmission ಶಕ್ತುದ್ಧ said devices rotatably axially Said O H ated e Sureq dials

dal and representing a predetermined istter, from said movement of the sireraft on casing for into the pointer may be actuating device remains to said smehronous interconnecting said dial wtatably mounting said dial in said casing, fixedly mounting sironaft, an actuating device, 2 said pointer instrument either pue Surseo O Ph Same said The predetermined direction to Aus including setting rotation thereof DIES d O combination dial predetermined desired settably rotated last-mentioned means, and stationary in said actuating Said actuating ಸರಿಕರ್ಗಾಂಡ cooperating with MO ITIW iz iz Trom Track a casing ecual reading condition <u>ತಿಇಗಿರ</u> the instrument thereafter by and pointer ائر از position with respect smounts said casing, ЦE adapted for uottieod Ω 0 Fb device for actuation by the S aircraft device pointer, said O 1-5 ea Co said pointer, while whereby in unison flight condition of flight to bring the for ۲; ۲said required indicates may indicating said means connecting Surtanom end simultaneous and said actuating be mounted, said dial and Sear means meens S S actuating relative casing, means ct O of means said S S astatod departure 古のな eaid device Drie

departure in either said pointer desired reading of on which ins a predetermined determined rotated actuation of thereof stationary in casing, eliciw stanome Sur sus ing in said casing, means rotatably device, by the latter, of means pointer instrument ins trument 怒 03 whereby said dial 는 는 and gear ត o e pointer, Trom direction fixedly noition (i) nosinu said pressure to braced including simultaneous instrument may said pointer ი ი said casing Said Sald combination in brie Surra means interconnecting mounting relativo said pointer on penimresopera from ornsserd condition of flight with respect transmission means a dial en eiroraft, Ø the pointer into Aq casing adapted for mounting on said भूपान evienodser and pointer may be settably by said pressure pand cooperating with said pressure said pressure responsive to said be mounted, responsive synchronous position indicates without 2 mounting said dial edt ot aircraft condition a pressure Said casing device interfering device connecting said said and movement O Fa casing Caid the same preeatenodsea setting indicating and in equal the responsive said pointer, for a ctuation dial and represent. responsive remains flisht. for any and pointer rotation with Ŗ, device device 20 the

fprewnwob alreraft pointer on said dial is horizontal same direction while simul taneous means 3 crtanom with said pointer for indicating airspeed, Mrspeed, for actuation by the latter connecting said pointer speed expands and contracts produced by device having means instrument indicator including ģ said pointer thereafter by said pressure rotatably mounting interconnecting said dial and pointer of said aircraft, relative stationary in on which the ζζ' said pressure respectively, prog Q, the aircraft board of ct 0 0 pus さって or downward represents a dial having rotated into a combination in an aircraft to said flight synchronous setting rotation thereof in any desired and seld pressure £0% ₽0% en aircraft, ξo indicator may said casing, in accordance with changes responsive casing casing of the ф О a pointer, represents and disposed to velocity pressures connecting said dial in said eanssead prese an airspeed scale in accordance with changes level airspeed indicated position adapted aircraft whereby said device and β device flisht. whereby said responsive D' 0 Q, ائے 12 transmission means level flight of pressure responsive ß for mounting on an equal amounts mounted, gebarture ó in which Ľ. responsive æ airspeed casing, of means fixedly responsive **pîtot** for causing Said casing, device Burradooo dial and movement the pointer paendn ÅÇ, in air tine seid in the device

pointer on said Mth respect as to bring the Thereby said synchronous settinarepsilonsaid dial wasing, and means m said casing, umbination the latter, mg said pointer machating device casing and in equal amounts in the and pointer for о С of means Teib e bas dial an indicating dial. the casing for Jeturod Sureams and pointer may be to said actuating device for Bulphraur rotation H. fixedly mounting rotatably mounting said cooperating into the said casing, causing simulteneous instrument a gear train thereof any desired reading of same predetermined position with settably a pointer, in unison relative said Surphiour said pointer, interconnecting same direction, actuating device rotated 0121 actuation by means Ø Sursao E, SOLC Dick connect-

posdser the pointer into the whereby said with the equal rotation thereof pointer for causing simultaneous ing a plenetary rotatably fixedly mounting said the latter, ing said pointer 25. an actuating ed unome dial. to the casing actuation of mounting said dial in ાં કા ನಿಗಡ in the device iz D ĝ rees in unison relative indicating instrument said actuating device ç, and pointer may be dial cooperating Same នគ្នាក្ន same direction and in said FO7 train interconnecting said said pointer by said actuating A Tree prodetermined position actuating casing, desired said casing, and synchronous witth device cr O rotated Ø reading pointer, Surpulour said casing, and E E without said pointer, of means sald casing, for actuation by so as to bue ဋ dia. sueem interfering said with setting means includand Surva connect-Sure E.

relation flight, and means for supporting alignment adjusting about the mith its pointer whereby said pointers, To dose not one behind the a plurality 8 in order to indicate said pointers STX said instruments O ⊢, Surteofing O Hý ್ವಿಕ್ಟಾಗ್ನ gusem flight-indicating instruments, said connecting each common shaft means, means o ct unit having parts said pointers may cause shaft arranged in planes desired conditions during said parts the same means extending through <u>۵</u>, said to move for manually Surstaduos in operative တ<u>ှ</u> instruments rotated Œ pesads zetatog 01 ಬ್

Engine S repro adjus ted instruments about connected thereto, mith its pointer said pointers, one behind for each of a plurality 27. Lor to indicate the cf O Surtroddns e il An indicating unit edt e cause and pointers whereby said pointers said instruments of flight O O ್ವಿ ಅಭ್ಯಂ gueem whereby desired eun said shoft suream said connecting each of said same to move common shaft indicating instruments, for menually Caro parts conditions during flight, suseu arranged having parts pointers may operative relation. into Λç susem the adjusting 片 alignment extending through planes spaced instrument Surstaduos be rotated instruments Ω said retarog 0 0 and

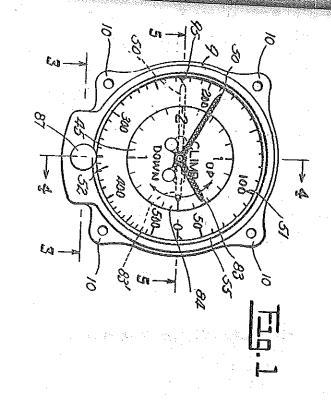
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Kaneis Elen Neshit

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Certified to be the drawings referred to the specification hereunto annexed.

taue, May

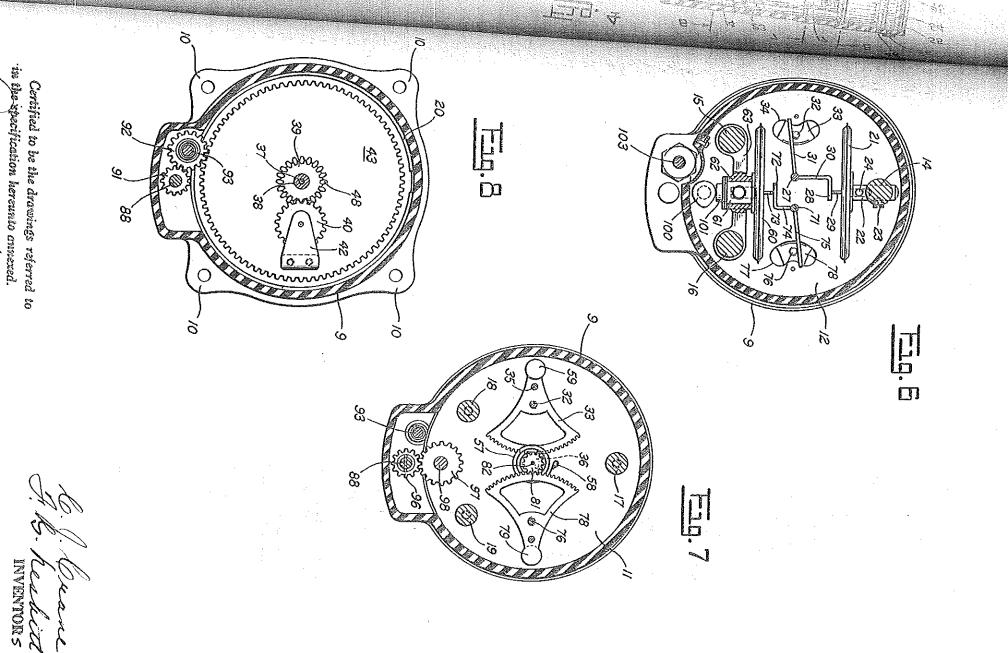
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The attention of Patentees is called to The Patent Act, 1935. Act, the following section of

Abuse of rights under patents.

"65. (1) The Attorney General of Canada or any person interested may at any time after the expiration of three years from the date of the grant of a patent apply to the Commissioner alleging in the case of that patent that there has been an abuse of the exclusive rights thereunder and asking for relief under this Act.

amounts to such abuse.

(2) The exclusive rights under a patent shall be deemed to have been abused in any of the following circumstances:—

worked within Canada) is not being worked within Canada) is not being worked within Canada is not being worked within Canada on a commercial scale, and no satisfactory reason can be given for such non-working:

Provided that, if an application is presented to the Commissioner on this ground, and the Commissioner is of opinion that the time which has elapsed since the grant of the patent has by reason of the nature of the invention or for any other cause been insufficient to enable the invention to be worked within Canada on a commercial scale, the Commissioner may make an order adjourning the application for such period as will in his opinion be sufficient for that purpose;

6 in his opinion be summercial to the invention within Canada on a commercial scale is being prevented or hindered by the importation from abroad of the patented article by the patentee or persons claiming under him, or by persons directly or indirectly purchasing from him, or by other persons against whom the patentee is not taking or has not taken any proceedings for infringement;

<u>c</u> If the demand for the patented article in Canada, is not being met to an adequate extent and on reasonable terms,

(d)If, by reason of the refusal of the patentee to grant a licence or licences upon reasonable terms, the trade or industry of Canada or the trade of any person or class of persons trading in Canada, or the establishment of any new trade or industry in Canada, is prejudiced, and it is in the public interest that a licence or licences should be granted;

<u>e</u>

If any trade or industry in Canada, or any person or class of persons engaged therein, is unfairly prejudiced by the conditions attached by the patentee, whether before or after the passing of this Act, to the purchase, hire, licence, or use of the patented article, or to the using or working of the patented process;

patent for an invention relating to a process involving the use of materials not protected by the patent or for an invention relating to a substance produced by such a process, has been utilized by the patentee so as unfairly to prejudice in Canada the manufacture, use or sale of any such materials.

(3) It is declared with relation to every paragraph of the next foregoing subsection that, for the purpose of determining whether there has been any abuse of the exclusive rights under a patent, it shall be taken that patents for new inventions are granted not only to encourage invention but to secure that new inventions shall so far as possible be worked on a commercial scale in Canada without undue delay."

Patentees are advised to other provisions of the Act. acquaint themselves with this and